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ECONOMIC COMMISSION FOR ASIA AND THE FAR EAST,

CAMBODIA, LAOS, THAILAND AND VIET-NAM.

Committee for Coordination of Investigations
of the Lower Mekong Basin

YEARLY REPORT ON THE ACTIVITIES OF THE FRENCH ICHTHYOLOGICAL MISSION

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The Ichthyological Mission's main objective for 1962, was the study of the consequences, upon the fresh water fish of Cambodia, of the construction of a dam on the Tonlé Sap.

Investigations, accordingly, chiefly centered around the following factors:

- Fish migrations,
- Locating the spawning sites,
- Oecology,
- Nature of the water (physico-chemical analysis),
- Geographic distribution of the different fish varieties,

etc,

In January 1962, a general survey of the Great Lake was undertaken with Mr.d'AUBENTON and Mr.CARBONNEL (sedimentologist), with the chief purpose of exploring the lakes (the great and the small one), inspecting the approaches to these lakes and of the stungs which flow into them, as well as visiting all the directors of the Service des Pêches of the various areas.

DOWNSTREAM FISHING

The way in which fish move from one place to another in Cambodia being related to the flood and ebb periods, that is with the current, one of the most important fishing campaigns takes place during the ebbing period from November to February.

During this period, we rented and operated a day located on the Tonlé Sap.

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This experimental fishing was constantly controlled, day and night, during the months of November and December 1961, and January and February 1962.

All the fish caught on the day during those four months was weighed, sorted, weighed again for each individual species, counted, measured (for some kinds only) and sometimes dissected.

"Weight-length" curves were prepared for the varieties considered as specially valuable.

The gonads and livers of numerous species were cut out, weighed, marked and preserved.

All the data collected during those four months of experimental downstream fishing were tabulated, and are now being processed by Mr. d'AUBENTON at the Paris Muséum National d'Histoire Naturelle.

We also, during the same period, collected for future laboratory study in Paris all the species of fish that we could catch. They were labelled, carefully packed, preserved in formol and are now in Paris where Mr. d'AUBENTON is studying them.

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GREAT LAKE

Beginning in February-March, the water of the Great Lake having sufficiently withdrawn, fishing begins in that huge natural Cambodian reserve.

The Direction du Service des pêches of Cambodia having put a river house at our disposal at Snoc-Trou, we installed in it a little "base". From Snoc-Trou, located exactly at the entrance of the small lake, we could travel around and prospect all the fishing sites located on the little lake and the southern half of the Great Lake, (the other half of the Great Lake being investigated from Siem Reap).

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The investigations on the fishing and fishes of the lakes mainly centered, as in the case of the Tonle Sap, around the following:

- the different varieties caught;
- the tonnage caught;
- the movements of these fishes (checked upon by means of additional fishing at Snoc-Trou bar);
- their diet;
- the maturity point of the gonads (ascertained through numerous dissections, on the spot and at the Snoc-Trou base);
- the "weight-length" factor of many species (ascertained through individual weighing and measurement);
- the kinds of fishing systems used, with indication of the kinds and quantity of fish caught with each type of apparatus, etc.

The small lake and part of the Great Lake were thus methodically prospected.

One or several specimens of the different kinds of fish caught in the lake were also preserved and sent to Paris, as well as a number of gonads.

At the end of March 1962, the Stung Sen was chosen for a special survey, as on this stung, very richly populated, a number of dams have been installed to catch the fish coming from tributary preks and as well as from the ebbing bengs.

On every dam on the Stung Sen, as far as in vicinity of Kompong Thom, the fishing was controlled as above: tonnage, species, weight for each different species, sizes, degree of maturity of the gonads, and so on.

As in the case of the data concerning the fishing on the Tonlo Sap, the information gathered and the results were typewritten, tabulated and sent to Paris where Mr. d'Aubenton is studying them.

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MEKONG

The month of April being low-stage period on the Mekong, two surveys, one in the region of Stung Treng, the other in the region of the Sambor

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falls, were undertaken in April 1962.

During the first two weeks, we prospected and fished in the Mekong and its tributaries (the Srepok, the Se San and the Se Kong) within a radius of about twenty kilometres around Stung Treng.

Sampans were rented on the spot for river travelling and carrying all the equipment required for the survey.

The hiring of guides was also a necessity, both on account of the currents, which sometimes are dangerous in those reaches, and for the locating of fishing sites.

Local fishermen were questioned about the tonnage of fish caught, the species, sizes and so on.

We also did some day and night fishing to check upon the information thus received.

Investigations in that area were conducted along the same lines as before, that is in connexion with tonnage, species, dissection, length-weight ratio, and so on.

Many specimens caught in that area were preserved, taken back to Phnom-Penh, prepared and sent to Paris.

On the way back, between Stung Treng and Phnom-Penh, all the stungs we encountered were studied with special care and thoroughly investigated.

These stays on and surveys of the different stungs enabled us to make good progress in connexion with the study of the geographic distribution of the species.

Many specimens were in this case also weighed, measured, dissected and classified for collecting purposes.

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The two last weeks of April were devoted to the study and prospection of the region of the Sambor Falls on the Mekong.

This is a region of falls and troughs, sometimes very deep, with its own special and little known fish life, and which could not be overlooked. It is very wild and practically uninhabited and very probably was not ever surveyed for ichthyological purposes.

The strong currents, whirlpools, and reefs made the exploration

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especially difficult.

It could not have been undertaken without guides, who were hired locally.

We rented sampans, tied them together and fitted them with a 15 H.P. outboard motor.

Upstream navigation on these rapids, over nearly 40 kilometres, was difficult and sometimes dangerous.

Fishing was conducted by day and by night, both by angling and with nets or cast-nets.

The fish thus caught was weighed, measured, dissected, prepared for collecting purposes, photographed, etc.

These two surveys on the Mekong, in the regions of Stung Treng and Sambor, enabled us to make some headway in the study of fish migrations as well as in the geographical distribution of the species.

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LARGE SCALE FISHING ON THE GREAT LAKE

The month of May is, with the month of April, the period of lowest water-level on the Great Lake. The volume of water being considerably reduced and the fish almost no longer crossing the bar at Snoc-Trou at that time, they find themselves virtually locked up in great numbers in the lake, and fishing is practised on a large scale.

The month of May was accordingly, like those of February and March, devoted to the control and study of the fish remaining in the lake during that period.

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EXPERIMENTAL FISHING DURING FLOOD PERIODS
(Upstream Movement of Fish)

The Ichthyological Mission wishing to control the upstream

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movement of fish, that is the fish entering the lake with the flood waters, we set up in the main preks of the Snoc-Trou bar several experimental fishing stations during the months of June and July.

We secured from the Direction des Pêches du Royaume permission to fish during the closing period.

Several dams, days and yors have so been installed on the busiest preks right from the beginning of the upstream migration.

This experimental fishing was controlled and studied uninterruptedly, round the clock, during all the month of June and the first part of July. The fish caught was weighed, sorted by varieties, weighed again for each individual species, counted, measured in the case of some species, and occasionnally dissected. The point of maturation of the gonads was ascertained and noted down for interesting varieties, etc.

During the same period, plancton fishing was carried out by day and by night. This plancton is now in the Museum National d'Histoire Naturelle in Paris where Mr. d'Aubenton is studying it. The results of his studies on the plancton will enable us to gather more precise information on the nature of eggs, fingerlings, and others entering the lake with the flood waters.

All the information gathered through this experimental high-stage fishing has been noted, tabulated and is at present being studied in Paris by Mr. d'Aubenton.

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We also carried out in August, in cooperation with the Hydrological Mission and the Sedimentarion Mission, a sampling and physico-chemical analysis survey of the work, in the region of Battambang, with particular attention to the Stung Sang Ké and its tributaries. Many samplings, both from the bottom and from the surface, were taken. The results of the analysis, made by the Institut Pasteur, are now processed in Paris by Mr. d'Aubenton.

Also during the month of August, we controlled the fish movement at kilometer 54 on the road Phnom-Penh - Kompong Cham. At a certain stage of the flood period, when the river reaches a certain level, part of the water

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of the Mekong flows along a canal, probably natural, which crosses the road at kilometer 54. That water washes the bengs as it flows along in the direction of the Tonle Sap. A very important fish movement takes place at that time.

We checked upon the travelling varieties and weighed, measured and preserved some interesting specimens for examination purposes in Paris.

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Mr. SCHMID's Botannical Mission being announced, we also made in August a survey of the region of Kompong Cham, on waters with certain desired peculiarities (trees that have been immersed for some time, etc.)

Mr. d'Aubenton's mission on the ichthyological study of the lower Mekong Basin and on the Tonle Sap coming to an end at the end of September, that month was used for working on certain documents, classification, sending fishes to Paris, as well as for many interviews with the Direction des pêches etc.

Mr. d'Aubenton left Phnom-Penh on 27 September 1962.

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During the month of October I did some surveying and small-scale fishing on the sturgs flowing into the Great Lake and in the Snoc-Trou region, for the purpose of stuying the fishing apparatus utilized, the varieties of fish caught, their sizes, weights, state of maturation of gonads, etc.

During the same period, a reconnaissance was made with a view to preparing the Botannical Mission on all the perimeter of the great and the small lake, with particular reference to the Tonle Chhma area.

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DOWNSTREAM FISHING

Ebbing-water fishing, when the fish is travelling downstream, is practised during the months of November, December, January and February. During the first half of November I studied fishing in the Tonlé Sap, controlling, as during the previous year, tonnage, weight by species, numbers, etc., as well as the fishing systems used, their yield for each species, both from the quantitative and qualitative viewpoint. The latter type of research was carried

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out within the frame of the study on "Fishing Technology".

These activities were carried out on all the days between Phnom-Penh (Quatre Bras) and Kompong Chhnang.

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In November also, I went with Messrs. BERTHELOT and LORGERE on a survey, covering over 350 Km on the Tonlé Toch.

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Mr. SCHMID's Botanical Mission also took place during the second half of November. The northern part of the great lake was first prospected from a base located in Siem Réap.

All the flooded forest north-est of Siem Réap was surveyed. All the stungs, preks and bengs of the region were prospected in the same way. All the flooded forest area of the western coast of the great lake, from Stung Sang Ké to Stung Prusat was prospected, all the stungs, preks and bengs were studied. Towards the end of the mission, from Siem Réap, we prospected the eastern coast from Siem Réap to Tonlé Chhma, the flooded forest and the stungs, preks and bengs.

From our base at Snoc-Trou, we then prospected the small lake and the Snoc-Trou region.

The first days were devoted to the western coast of the small lake where we prospected the flooded forest, the stungs, preks and bengs.

The Tonlé Chhma zone was studied more in detail. This region, very indented and most interesting from the ichthyological viewpoint was prospected in totality. We went up all the stungs flowing into the small lake called Tonlé Chhma and studied them.

The Snoc-Trou bar, the Stung Sen and all the delta between Kompong Chhnang and Snoc-Trou were also prospected.

In the course of that botanical mission, all the stungs and preks were prospected as far up as we could get in a boat, that is roughly up to the extreme limit of the flooded forest.

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All the grass-grown areas on the edge of the lake and the outlet of the stung were explored.

In the course of this mission, Mr. SCHMID took many samples of various plants.

We also took during that survey over hundred pH of the water in the spots considered most interesting.

I lastly took advantage of that general survey of the lake and of the flooded forest to get from all the fishermen I met ichthyological data which will most usefully add up to the information already gathered in the course of the previous year.

During this botanical mission, over 1.000 Km were covered in motor boat on the lakes and stungs.

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DOWNSTREAM FISHING (followed)

All the month of December was devoted to downstream fishing. All investigations, controls and surveys being similar to those done in connexion with November fishing on the Tonlé Sap.

Every day was separately studied; fishing being controlled, then analysed, in relation to the spot, the nature of the current, of the bottom, of the weather, as well as the time. All the information gathered was noted down and sent to Paris where it is processed by Mr. d'Aubenton.

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In addition to those field surveys, the Ichthyological Mission also carried out, or caused to be carried out, various analyses, including:

On the one hand, for 1962, daily physico-chemical analyses of the waters of the Mekong and the Tonlé Sap. These analyses are being made by the Institut Pasteur in Phnom-Penh, and concern the following:

- temperature,

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- pH,
- resistivity,
- dissolved exygen,
- alkalinity,
- hardness,
- turbidity

Furthermore, during the period of flood and the period of ebb, water was sampled and analysed in different stations which we set up in Snoc-Trou.

The results of these analyses was to enable us to observe water modifications in connexion with the progress of forest flooding study thereafter the behaviour of the fish in these different areas.

All the data have been tabulated and sent to Paris where they are being processed.

Tabulations of the floods of the Mekong and of the Tonlé Sap have been set up since January 1, 1961, and are regularly sent to Paris. The water heights are given by the Cambodian services and then tabulated by ourselves.

Lastly, the Ichthyological Mission keeps some fish in ponds for observation purposes. Periodically, some specimens are caught and dissected to check upon the physiological process of maturation in closed space.

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In the course of the downstream fishing operations from November 1962 to January 1963, 66 tons and 433 kilogrammes of fish were caught and examined between 16/11/61 and 17/1/62 on our experimental fishing day on the Tonlé Sap.

During the experimental upstream fishing period, in Snoc-Trou, 26 tons and 948 kilogrammes of fish were caught. They were all studied, weighed, numbered, etc.

In 1961 and 1962 we preserved, then sent to Paris 1, 039 fish from roughly 144 different varieties.

We also caught, preserved and sent to Paris 40 other varieties

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of "small fish".

In the same period, we extracted the gonads from two and a half tons of fish, chosen among thirty-five of the most interesting kinds; they were weighed, preserved and sent to Paris.

The year 1962 was therefore chiefly devoted to the survey of fish migration. These studies were directed by Mr. d'Aubenton until the end of September 1962.

The Ichthyological Mission of the Lower Basin of the Mekong and of the Tonlé Sap has been run by me until the end of 1962.

It will continue until November 1963, when it will more particularly deal with the "technology of fishing". In March 1963, Mr. d'Aubenton will take over the supervising activities.

I cannot,in this report, submit technical conclusions on our mission. Mr. d'Aubenton, head of the Ichthyological Mission, is still working in his laboratory in Paris on the further analysis and research required for a full report and he alone has the authority to submit it.

Phnom-Penh, 4 January 1963

(Signed):FILY